WHAT IS CLAIMED IS:

1. A method for creating a refractive gradient within a glass tube, comprising the steps of:

applying a beam of laser energy to the glass tube;

penetrating the glass tube with the beam of laser energy to create a channel in the glass tube;

providing the beam of laser energy through the channel to a starting point on a region of the glass tube; and

moving the beam of laser energy relative to the starting point to create the refractive gradient within the region of the glass tube.

2. The method of claim 1, wherein the region comprises an inside diameter surface of the glass tube.

3. The method of claim 2, wherein the providing step further comprises providing the beam of laser energy through the channel to heat a reactant gas disposed within an area defined by the inside diameter surface of the glass tube, thus causing the reactant gas to selectively react and deposit a coating layer on the inside diameter surface.

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4. The method of claim 3, wherein the providing step further comprises providing the beam of laser energy to the coating layer causing thermal diffusion of the coating layer into the glass tube.

5. The method of claim 1, wherein the region comprises a coating layer on an inside diameter surface of the glass tube.

6. The method of claim 5, wherein the providing step further comprises providing the beam of laser energy at a first energy level to the coating layer, thus causing migration of the coating layer into the glass tube at a desired depth from the inside diameter surface.

7. The method of claim 5, wherein the providing step further comprises providing the beam of laser energy to the coating layer for a predetermined amount of time, thus causing migration of the coating layer into the glass tube at a desired depth from the inside diameter surface.

8. The method of claim 5, wherein the providing step further comprises selectively focusing the beam of laser energy to a predefined depth within the coating layer to cause migration of the coating layer into the glass tube.

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9. The method of claim 5, wherein the providing step further comprises selectively applying the beam of laser energy to the coating layer.

10. The method of claim 1, wherein the moving step further comprises rotating the glass tube while selectively applying the beam of laser energy.

11. The claim of the method of claim 1, wherein the moving step further comprises linearly moving the glass tube along a longitudinal axis of the glass tube while selectively applying the beam of laser energy.

12. The method of claim 1, wherein the moving step further comprises rotating the glass tube around a longitudinal axis of the glass tube and linearly moving the glass tube relative to the longitudinal axis while selectively applying the beam of laser energy.

13. The method of claim 1, further comprising the step of re-fusing the glass tube that is penetrated as the beam of laser is moved relative to the glass tube.

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14. A method for creating a refractive gradient within a glass object, comprising the steps of:

focusing a plurality of beams of laser energy as a composite beam at a starting point;

applying the composite beam to an inside diameter surface and an inner region of the glass object below the inside diameter surface;

selectively heating the inside diameter surface and the inner region using the composite beam to cause a first change in the refractive index characteristic of the inside diameter surface and the inner region;

moving the composite beam relative to the glass object; and

selectively heating an adjacent surface and an adjacent region below the adjacent surface with the composite beam to cause a second change in the refractive index characteristic, the first change and the second change forming the refractive gradient within the glass object.

15. The method of claim 14 further comprising the step, prior to selectively heating the inside diameter surface, of heating a reactant gas disposed within the glass object causing the reactant gas to selectively react and deposit a coating layer on the inside diameter surface and the adjacent surface.

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16. The method of claim 15, wherein the step of selectively heating the inside diameter surface further comprises selectively heating the coating layer near the inside diameter surface to cause thermal diffusion of the coating layer into the inner region of the glass object; and

wherein the step of selectively heating the adjacent surface further comprises selectively heating the coating layer near the adjacent surface to cause thermal diffusion of the coating layer into the adjacent region of the glass object.

17. The method of claim 16, wherein the step of selectively heating the inside diameter surface step further comprises selectively heating the coating layer near the inside diameter surface for a predetermined amount of time causing migration of the coating layer to a desired depth from the inside diameter surface.

18. The method of claim 17, wherein the step of selectively heating the adjacent surface step further comprises selectively heating the coating layer near the adjacent surface for a predetermined amount of time causing migration of the coating layer to a desired depth from the adjacent surface.

19. The method of claim 14, wherein the moving step further comprises rotating the composite beam relative to the glass object.

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20. The method of claim 14, wherein the moving step further comprises linearly moving the composite beam relative to the glass object while selectively applying the composite beam.

21. The method of claim 20, wherein the refractive gradient within the glass object is planar.

22. The method of claim 20, wherein the linearly moving step further comprises rotating the composite beam relative to a longitudinal axis of the glass object and linearly moving the composite beam relative to the glass object.

23. The method of claim 14, wherein the focusing step further comprises adjusting the focal point of each of the beams of laser energy to provide a laser beam focal field.

24. An apparatus for creating a refractive gradient within a glass tube, comprising:

a controller;

a laser energy source in communication with the controller, the laser energy source being capable of selectively providing a beam of laser energy at a

selectable energy level; and

a reflective conduit configured to receive the beam of laser energy from the laser energy source and in communication with the controller, the reflective conduit being operative to selectively direct the beam of laser energy to dopant material on an inside diameter (ID) surface of the glass tube causing thermal diffusion of the dopant material into the glass tube in response to signals from the controller, the reflective conduit being further operative to move the beam of laser energy relative to the ID surface in response to the signals causing further thermal diffusion of the dopant material and creating the refractive gradient within the glass tube.

25. The apparatus of claim 24, wherein the reflective conduit is further operative to provide the beam of laser energy to a reactant gas disposed within an area defined by the ID surface of the glass tube, thus causing the reactant gas to heat and deposit the dopant material on the ID surface within the glass tube.

26. The apparatus of claim 24, wherein the laser energy source is further operative to provide the beam of laser energy to the dopant material via the reflective conduit for a predetermined amount of time, thus causing migration of the dopant material into the glass tube at a desired depth from the ID surface.

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27. The apparatus of claim 24, wherein the reflective conduit is further operative to rotate the orientation of the beam of laser energy relative to the glass tube while the laser energy source selectively provides the beam of laser energy at the selectable energy level.

28. The apparatus of claim 24, wherein the reflective conduit is further operative to linearly move the beam of laser energy relative to a longitudinal axis of the glass tube while the laser energy source selectively provides the beam of laser energy at the selectable energy level.

29. The apparatus of claim 24, wherein the reflective conduit is further operative to rotate the orientation of the beam of laser energy relative to the glass tube and to linearly move the beam of laser energy relative to a longitudinal axis of the glass tube while the laser energy source selectively provides the beam of laser energy at the selectable energy level.

30. The apparatus of claim 24 further comprising a movable working surface configured to support the glass tube as the beam of laser energy is applied to the glass tube by the reflective conduit, the movable working surface being operative to move the glass tube as the beam of laser energy is selectively applied by the laser energy source

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and the reflective conduit.

31. An apparatus for creating a refractive gradient within a glass tube, comprising:

a programmable controller capable of executing instructions and producing laser control signals and working surface control signals;

a laser energy source in communication with the programmable controller, the laser energy source being capable of selectively providing a beam of laser energy to dopant material on an inside diameter (ID) surface of the glass tube in response to the laser control signals; and

a movable working surface in communication with the controller, the movable working surface being positioned relative to the laser energy source and configured to support the glass tube as the beam of laser energy is applied to the dopant material on the ID surface of the glass tube causing thermal diffusion of the dopant material into the glass tube, the movable working surface being further operative to selectively move the glass tube relative to the ID surface in response to the working surface control signals as the beam of laser energy is selectively applied from the laser energy source causing further thermal diffusion of the dopant material and creating the refractive gradient within the glass tube.

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32. The apparatus of claim 31, wherein the laser energy source is further operative to provide the beam of laser energy through a channel to a reactant gas disposed within an area defined by the ID surface of the glass tube, thus causing the reactant gas to heat and deposit the dopant material on the ID surface within the glass tube.

33. The apparatus of claim 31, wherein the laser energy source is further operative to provide the beam of laser energy to the dopant material for a predetermined amount of time, thus causing migration of the dopant material into the glass tube at a desired depth from the ID surface.

34. The apparatus of claim 31, wherein the movable working surface is further operative to rotate the glass tube relative to the orientation of the beam of laser energy while the laser energy source selectively provides the beam of laser energy at the selectable energy level.

35. The apparatus of claim 34, wherein the movable working surface is a rotating lathe and adjustable chuck for supporting the glass tube.

36. The apparatus of claim 31, wherein the movable working surface is further operative to linearly move the glass tube along a longitudinal axis of the glass tube while

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the laser energy source selectively provides the beam of laser energy at the selectable energy level.

37. The apparatus of claim 31, wherein the movable working surface is further operative to rotate the orientation of the glass tube relative to the beam of laser energy and to linearly move the glass tube along a longitudinal axis of the glass tube while the laser energy source selectively provides the beam of laser energy at the selectable energy level.

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